system and the fuel cell is not needed. Thus, fuel will be conserved. The present invention allows intermediate settings, which can react to temperature changes and provide the ability to cold start the fuel cell. The assembly of the present invention also has the ability to control fuel flow in an otherwise passive fuel cell system and thereby hold operation at a maximum efficiency point as desired in the particular application in which the present invention is employed.

The foregoing description has been directed to specific embodiments of the invention. It will be apparent, however, that other variations and other modifications may be made to the described embodiments, with the attainment of some or all of the advantages of such. Therefore, it is the object of the appended claims to cover all such variations and modifications as come within the true spirit and scope of the invention.

What is claimed is:

CLAIMS

1. 1. A direct oxidation fuel cell system having controllable fuel delivery, comprising;

(A) a a vaporous fuel feed;

(B) a fuel cell including a catalyzed membrane electrode assembly, having an anode aspect and a cathode aspect, and said anode aspect receiving said vaporous fuel feed;

(C) an adjustable fuel delivery regulation assembly that controls either the generation of said vaporous fuel from a liquid fuel, or controls said vaporous fuel feed as it travels towards said anode aspect;

(D) said adjustable fuel delivery regulation assembly having variably actuated member which in a first state provides that the assembly is substantially closed in which fuel flow is substantially restricted, and a second state, which produces a plurality of openings in the assembly through which fuel is permitted to flow generally towards the anode aspect of the catalyzed membrane electrolyte; and

(E) a load coupled across said fuel cell, providing a path for electricity generated by the fuel cell.

2. The direct oxidation fuel cell system having controllable fuel delivery as defined in claim 1 wherein said fuel delivery regulation assembly also has an intermediate position in which an amount of fuel flow can be controlled.

3. The direct oxidation fuel cell system having controllable fuel delivery as defined in claim 1 further comprising a mass transport barrier disposed within said fuel cell to effect a change in phase from a liquid fuel to a vaporous fuel and wherein said fuel delivery regulation assembly is placed between the source of fuel and the mass transport barrier to restrict the flow of liquid fuel to said mass transport barrier, thus restricting vapor generation.

4. The direct oxidation fuel cell system having controllable fuel delivery as defined in claim 1 further comprising a mass transport barrier disposed within said fuel cell to effect a change in phase from a liquid fuel to a vaporous fuel and wherein said fuel delivery regulation assembly is placed between the mass transport barrier and the fuel cell to restrict the flow of vaporous fuel to said fuel cell.

5. The direct oxidation fuel cell system having controllable fuel delivery as defined in claim 1 wherein said fuel delivery regulation assembly includes a first component that includes an aperture, and a corresponding second component such that placement of the first component relative to the second component results in an opening that permits the flow of fuel therethrough or a closure that restricts fuel flow.

6. The direct oxidation fuel cell system having controllable fuel delivery as defined in claim 5 wherein said first and second components are generally planar components that include corresponding apertures, which when aligned create an opening and said first and second components can be adjusted relative to one another to control fuel flow through said opening.

7. The direct oxidation fuel cell system having controllable fuel delivery as defined in claim 5 wherein said first component is a housing that receives a fuel feed from said fuel source and is adapted to permit fuel to flow through said housing towards said catalyzed membrane electrolyte, and said second component includes one or more rotatably-mounted rods that include apertures therein, which when rotated can restrict fuel flow, or permit fuel flow through said housing depending upon the rotation of said one or more rods.

8. The direct oxidation fuel cell system having controllable fuel delivery as defined in claim 5 wherein said first component is a housing that receives a fuel feed from said fuel source and is adapted to permit fuel to flow through said housing towards said catalyzed membrane electrolyte, and said second component includes one or more hinged

louvers that when rotated about a hinge, restrict fuel flow, or permit fuel flow, through said housing depending upon the rotation of said one or more louvers.

9. The direct oxidation fuel cell system having controllable fuel delivery as defined in claim 1 further comprising a control system for variably actuating the position of said fuel delivery regulation assembly.

10. The direct oxidation fuel cell system having controllable fuel delivery as defined in claim 1 further comprising a sealing substances provided within said fuel cell system to substantially resists leakage of fuel from said fuel delivery regulation assembly, or said fuel cell system.

11. The direct oxidation fuel cell system having controllable fuel delivery as defined in claim 1 further comprising a source of fuel which is a fuel tank and said fuel delivery regulation assembly is disposed within said fuel tank.

12. The direct oxidation fuel cell system having controllable fuel delivery as defined in claim 1 wherein said fuel delivery regulation assembly is disposed within said fuel cell system.

13. The direct oxidation fuel cell system having controllable fuel delivery as defined in claim 11 wherein said source of fuel is a fuel tank and said fuel delivery regulation assembly includes a first component that is disposed in said fuel tank, and a second component that is disposed in said fuel cell.

14 The direct oxidation fuel cell system having controllable fuel delivery as defined in claim 4 further comprising a fuel tank, and one of said first and second planar components that include corresponding apertures, is disposed in said fuel tank and the other shutter component is disposed in said fuel cell.

15. A method of controlling the delivery of a vaporous feed fuel to a direct oxidation fuel cell, including the steps of:

(A) providing an adjustable fuel delivery regulation assembly that controls either the generation of said vaporous feed from a liquid fuel, or controls said vaporous fuel feed as it travels towards said anode aspect;

(B) variably actuating a member in said adjustable fuel delivery regulation assembly to a first position when it is desired that the assembly is substantially closed to substantially restrict fuel flow; and

(C) variably actuating said member in said adjustable fuel delivery regulation assembly to a second position, which produces a plurality of openings in the assembly through which fuel is permitted to flow generally towards the anode aspect of the catalyzed membrane electrolyte, when it is desired to increase fuel flow.

16. The method of controlling the delivery of a vaporous feed fuel to a direct oxidation fuel cell as defined in claim 15, including the further step of:

providing a mass transport barrier disposed within said fuel cell to effect a change in phase from a liquid fuel to a vaporous fuel and wherein said fuel delivery regulation assembly is placed between the source of fuel and the mass transport barrier to restrict the flow of liquid fuel to said mass transport barrier, thus restricting vapor generation.

17. The method of controlling the delivery of a vaporous feed fuel to a direct oxidation fuel cell as defined in claim 15, including the further step of:

providing a mass transport barrier disposed within said fuel cell to effect a change in phase from a liquid fuel to a vaporous fuel and wherein said fuel delivery regulation

assembly is placed between the mass transport barrier and the fuel cell to restrict the flow of vaporous fuel to said fuel cell.